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DATA NOTE

REVISED The Avon Longitudinal Study of Parents and Children - A resource for COVID-19 research: Questionnaire data capture May-July 2020 [version 2; peer review: 2 approved]

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Abstract







The Avon Longitudinal Study of Parents and Children (ALSPAC) is a prospective population-based cohort study which recruited pregnant women in 1990-1992 and has followed these women, their partners and their offspring ever since. The study reacted rapidly to the coronavirus disease 2019 (COVID-19) pandemic, deploying an online questionnaire early on during lockdown (from 9th April to 15th May). In late May 2020, a second questionnaire was developed asking about physical and mental health, lifestyle and behaviours, employment and finances.


The online questionnaire was deployed across the parent and offspring generations between the 26th May and 5th July 2020. 6482 participants completed the questionnaire (2639 original mothers, 1039 original fathers/partners, 2711 offspring (mean age ~28 years) and 93 partners of offspring). 1039 new participants who did not respond to the first questionnaire deployed in April completed the second questionnaire. A positive COVID-19 test was reported by 36 (0.6%) participants (12 G0 and 24 G1), 91 (1.4%; 35 G0 and 56 G1) reported that they had been told by a doctor they likely had COVID-19 and 838 (13%; 422 G0 and 416 G1) suspected that they have had COVID-19.


The observational data from both COVID questionnaires will be complemented with linkage to health records and results of biological testing as they become available. In combination, these data may help us identify true cases. Data has been released as an update to the original dataset released in May 2020. It comprises: 1) a standard dataset containing *all* participant responses to both questionnaires with key sociodemographic factors and 2) as a composite release coordinating data from the existing resource, thus enabling bespoke research across all areas supported by the study. This data note

Open Peer Review

Reviewer Status  

	Invited Reviewers	
	1	2
version 2		
(revision)		
22 Sep 2020		
version 1		
09 Sep 2020	 report	 report

1. **Denny Meyer** , Swinburne University of Technology, Melbourne, Australia

2. **Crispim Cerutti Junior** , Universidade Federal do Espírito Santo (Ufes), Vitória, Brazil

Any reports and responses or comments on the article can be found at the end of the article.

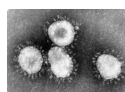
describes the second questionnaire and the data obtained from it.

Keywords

ALSPAC, Children of the 90s, birth cohort study, COVID-19, coronavirus, online questionnaire, mental health



This article is included in the [Avon Longitudinal Study of Parents and Children \(ALSPAC\)](#) gateway.



This article is included in the [Coronavirus \(COVID-19\)](#) collection.

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Author roles: **Northstone K:** Conceptualization, Data Curation, Formal Analysis, Funding Acquisition, Investigation, Methodology, Project Administration, Visualization, Writing – Original Draft Preparation; **Smith D:** Data Curation, Formal Analysis, Methodology, Project Administration, Writing – Review & Editing; **Bowring C:** Methodology, Project Administration, Supervision, Writing – Review & Editing; **Wells N:** Data Curation, Project Administration, Resources, Software, Writing – Review & Editing; **Crawford M:** Data Curation, Software, Writing – Review & Editing; **Haworth S:** Conceptualization, Writing – Review & Editing; **Timpson NJ:** Conceptualization, Funding Acquisition, Methodology, Supervision, Writing – Review & Editing

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REVISED Amendments from Version 1

The second version of our manuscript takes into account the constructive comments from reviewer 2. In particular we have emphasised the descriptive nature of the data we have obtained and that we cannot claim 'case' status based on the results. The changes primarily take place in the abstract (removal of algorithm estimated case prevalence and emphasis of observational data) and the discussion (expansion of limitations).

Any further responses from the reviewers can be found at the end of the article

Introduction

Mitigation strategies against the coronavirus disease 2019 (COVID-19) pandemic in the UK escalated in March 2020, leading to a comprehensive set of restrictions on normal life (termed the 'lockdown') which took effect on March 23rd 2020. Since then a gradual lifting of the restrictions has been introduced in England in particular. These include certain school years being allowed to return to school, groups of up to six people being allowed to meet outdoors (whilst adhering to social distancing), non-essential shops, pubs and restaurants re-opening and certain competitive sports returning behind closed doors¹. However, many normal activities remain restricted and the long-term impact of COVID-19 on employment, the economy and peoples' livelihoods seems likely to be substantial. The COVID-19 pandemic and associated mitigation strategies will affect not just physical health in those who catch the virus, but also mental health, future employment, financial activity and personal relationships. It is therefore important for longitudinal population studies to continue to measure prospectively the impact of lockdown and its easing on their participants. Such studies are needed to understand the ongoing effects of mitigation strategies on health and well-being and identifying inequalities in response to the pandemic.

The Avon Longitudinal Study of Parents and Children (ALSPAC) is a unique three-generational study, comprising 'G0': the cohort of original pregnant women, the biological father and other carers/partners; 'G1': the cohort of index children; and 'G2': the cohort of offspring of the index children. The study has a wealth of biological, genetic and phenotypic data across these generations²⁻⁵. ALSPAC has been well placed to capture information across key parts of the population in light of the COVID-19 pandemic – in particular the contrast between those in higher risk (the G0 cohort; mean age ~59 years) and lower risk (the G1 cohort; mean age ~28 years) groups. We have been able to collect repeat data quickly using our existing infrastructure for online data collection.

The wider COVID-19 data collection in ALSPAC will include data from three main sources: self-reported data from questionnaires, data from clinical services based on linkage to medical and other records and information from biological samples. The data from these sources are intended to be complementary and help address different potential research questions around COVID-19.

This data note describes the data collected via our *second* online questionnaire between 26th May and 5th July 2020 and provides a summary of the participants who responded. The update to the original dataset obtained from our first online questionnaire⁶ is described here, together with any variables that have been derived using both sets of questionnaire data. We also present a brief assessment of the factors associated with completing the first COVID questionnaire but not the second in this population.

Methods

Setting

ALSPAC is an intergenerational longitudinal cohort that recruited pregnant women residing in Avon, UK with expected dates of delivery 1st April 1991 to 31st December 1992^{2,3}. The initial cohort consisted of 14,541 pregnancies resulting in 14,062 live births and 13,988 children who were alive at 1 year of age. From the age of seven onwards, the initial sample was bolstered with eligible cases who had originally failed to join the study and there were subsequently 14,701 children alive at 1 year of age following this further recruitment⁴. Please note, the study website contains details of all the data that is available through a fully [searchable data dictionary](#) and [variable search tool](#).

In response to the COVID-19 it was necessary to develop a data collection strategy which was practical, would yield data quickly and could be updated and repeated if necessary. For these reasons, we chose to use an online only data collection approach for this, restricting our invites to those participants with a valid email address (and coordinated with a systematic communications/outreach campaign to obtain updated information from participants). The questionnaire was developed and deployed using REDCap (Research Electronic Data CAPture tools⁷); a secure web application for building and managing online data collection exercises, hosted at the University of Bristol. The development of the first questionnaire is described elsewhere⁶.

Content design

Content for our second questionnaire was selected to address three needs:

1. The need to track changes in health and wellbeing over time using repeated measures. To address this, we repeated a panel of questions from our first questionnaire (e.g. mental health). By repeating questions, we are able to capture information about participants who did not complete the first COVID questionnaire.
2. The need to harmonize data collection with other cohorts to facilitate co-ordinated analyses. We addressed this by incorporating content from a coordinated and [freely available COVID-19 questionnaire](#) co-developed by ALSPAC. This questionnaire was developed in consultation with a network UK and international longitudinal population studies and partners through a process facilitated by Wellcome (see acknowledgements), which was still being developed at the time of the first COVID questionnaire.

3. The need to gather data to investigate specific hypothesis which could not be tested using the first questionnaire. These topics were suggested by our collaborators and included:

- Food intake – Dr Laura Johnson, University of Bristol
- Alcohol intake – Professor Matt Hickman, University of Bristol
- Gambling – Professor Alan Emond, University of Bristol
- Perception of risk – Professor Marcus Munafo, University of Bristol and Drs Alexandra Freeman and Sarah Dryhurst, University of Cambridge
- Social contacts – Drs Amy Thomas and Ellen Brooks Pollock, University of Bristol

The questionnaire included 4 sections, and captured information on the following:

- Seasonal symptoms**
 - Symptoms of COVID-19 and negative control symptoms since mid-April 2020 (symptoms repeated from Q1)
 - Diagnosis with COVID-19 and resulting treatment
 - Whether participants were happy to be contacted about future research projects involving testing or taking biological samples
- Behaviour as a result of COVID-19**
 - Lifestyle changes since lockdown started
 - Food intake in the past month
 - Alcohol use (AUDIT-C;⁸)
 - Gambling
 - Social contacts and methods of communication (repeated from Q1 with additional age groups)
 - Details of self-isolation (repeated from Q1)
- Impact of the pandemic**
 - Worries during the pandemic (repeated from Q1)
 - Depression assessed using the Short Moods and Feelings questionnaire (SMFQ;⁹; repeated from Q1)
 - Anxiety assessed using the General Anxiety Disorder-7 questionnaire (GAD7;¹⁰; repeated from Q1)
 - Well-being assessed using the Warwick-Edinburgh Mental Wellbeing Scales (WEMWBS;¹¹; repeated from Q1)
 - Perception of risk
 - Free text inviting participants to provide details of other ways they have been affected by the pandemic
- About you and who you live with during the pandemic**
 - Type and number of people participant lives with
 - Changes in living arrangements as a result of the pandemic

- Postcode of current living location for geocoding purposes

E. Employment and finances during the pandemic

- Employment prior to and during lockdown
- Keyworker status and employment sector
- Managing financially and claiming benefits
- Food security

F. Children

- Number of children and childcare support needs (G1 offspring with children enrolled in the ALSPAC-G2 study (children of the Children of the 90s⁴) only)

We then provided a separate questionnaire for those G1 participants who had children enrolled in our G2 study. The contents and results of that additional questionnaire will be reported elsewhere.

The final questionnaire (REDCap PDF) used is available with the associated data dictionary (which includes frequencies of all variables that are available) and both are available as extended data¹².

Invitation and reminder strategy

Between the 26th and 29th May 2020, all participants (G0, G1 and G1 partners enrolled as part of G2⁵) for whom we had an active email address were sent an invitation to complete the questionnaire (n=12,560). Invites were tailored according to whether participants had completed the first questionnaire and according to gender, as we wanted to particularly encourage those who had not responded to the first questionnaire and males. On 10th, 19th and 26th June, a further 169, 119 and 50 additional invites were sent out respectively, as a result of outreach work undertaken by the ALSPAC team. Participants were not contacted if our administrative database record indicated that they were deceased, had withdrawn from the study, had declined further contact or had declined questionnaires. The questionnaire survey was live on the online platform for just over one month. On the 11th and 12th June, any non-responders respectively were sent a reminder email to complete the questionnaire and a further text message was sent on 18th June to those for whom we had a current mobile phone number. Finally, 1,972 dedicated reminders were sent on 26th June to those participants who had previously completed our first COVID questionnaire but had not yet responded to the second. Compared to the first COVID questionnaire, we received a slower response to this questionnaire which required a different reminder process in order to increase participation (compare [Figure 1](#) with the corresponding figure in our previous data note⁶).

In addition, traditional (print, radio, tv) & social media (Facebook, Instagram and Twitter) were used to inform participants that the questionnaire was live, asking them to contact us if they had not received it and to encourage completion. These communication channels were also used to encourage re-engagement of friends and family back into the study. Unlike our standard questionnaires (usually completed annually) we did not provide any incentive for completion; however, we did offer a prize

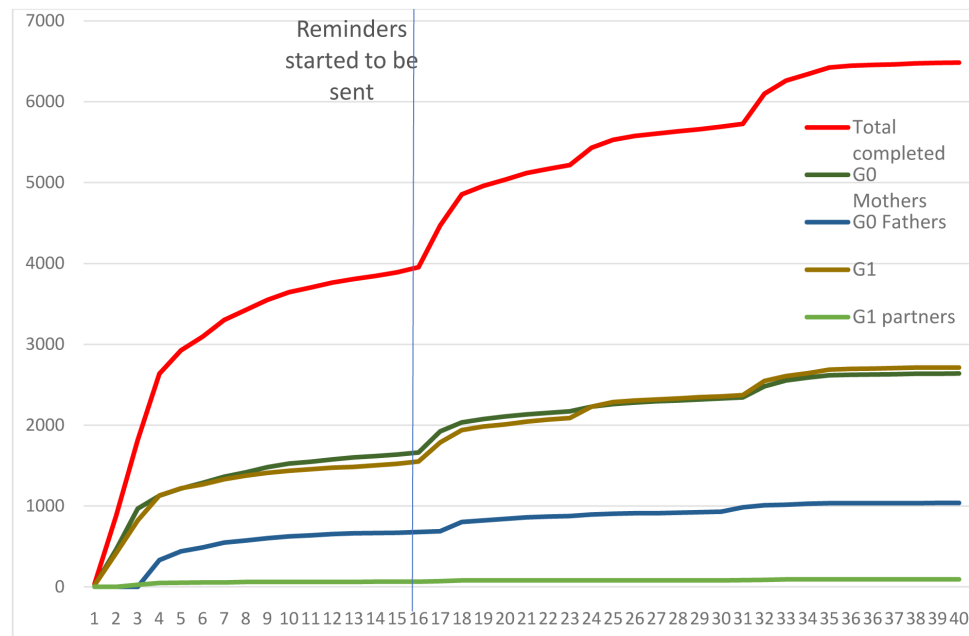


Figure 1. Completion rate by number of days second questionnaire was live.

draw (three prizes of £100) for those who completed their questionnaire by 29th June.

Response rate

A total of 12,898 invitations were sent out and responses were received from 6482 participants (overall response rate of 50%) - see [Figure 1](#).

As with our first COVID questionnaire, female participants were much more likely to respond than male participants. [Table 1](#) summarises the response rate within each group organised by cohort structure. Response rate amongst G0s was similar for the second questionnaire compared to the first (57% vs 58%). A smaller proportion of G1 participants responded to the second compared to the first questionnaire (44% vs 51%). 1367 participants completed the first questionnaire but not the second and 1039 completed the second questionnaire but not the first. This means data is available from both questionnaires for 5443 participants in total.

Key results

Characteristics of responders according to key variables that will be released with the complete dataset can be seen in [Table 2](#). The population who responded were predominantly white (> 96%) and the majority had at least A-level qualifications (optional exams sat at the age of 18 years), with almost 80% of the G1 cohort in this category. Fathers were 3 years older on average than mothers (61.1 years vs 58.1 years) and G1 partners were two years older than G1 participants on average (29.8 years versus 27.8 years).

As with the first questionnaire, participants were asked whether they thought they have had COVID-19. Options were: 'Yes,

confirmed by a positive test', 'Yes, suspected by a doctor but not tested', 'Yes, my own suspicions' or 'No'. In the second questionnaire 36 (0.6%) respondents reported that they had tested positive to COVID-19, 91 (1.4%) reported that COVID-19 was suspected by a doctor but not tested and 838 (13%) believed they had COVID-19 due to their own suspicions. [Table 3](#) summarises the responses to this question by cohort structure. Due to small numbers we have had to combine the first two categories together for the released dataset.

Of the 5409 who completed this question in both questionnaires, over 90% of people gave the same response in both questionnaires ([Table 4](#)). There was a little more variability in the report of cases due to 'own suspicions', but this is not surprising given that since March 2020 there have been changes in the list of symptoms of COVID-19 in both official guidance in the UK and in media reports. Additionally, as the questionnaires were conducted approximately one month apart, it is possible that some participants became infected with COVID-19 after questionnaire 1 but before questionnaire 2; disagreement may not therefore necessarily reflect measurement error.

As with the first questionnaire we applied the algorithm derived by Menni and colleagues¹³ to predict 'probable infection' using data collected from an app-based symptom tracker^{14,15}. This analysis was performed using [Stata v15.0](#). This algorithm uses four symptoms: loss of smell and taste, severe or significant persistent cough, severe fatigue and skipped meals (coded as 1 if present and 0 otherwise), together with age and sex (1 male; 0 female). We had slight differences in wording and thus the algorithm (using the same weightings) applied was as follows:

$$-1.32 - (0.01 \times \text{age}) + (0.44 \times \text{sex}) + (1.75 \times \text{loss of smell or taste})$$

Table 1. Number of participants who were eligible and who responded to the second COVID-19 questionnaire.

Cohort Group	Eligible ¹	Responded to Q2 ²	Responded to Q1 and Q2
G0 Mothers	4646	2639 (57%)	2303 (50%)
G0 Fathers/partners	1821	1039 (57%)	871 (48%)
G1 Offspring daughters	3753	1914 (51%)	1575 (42%)
G1 Offspring sons	2395	797 (33%)	617 (26%)
G1 Offspring partners (female)	102	56 (55%)	49 (48%)
G1 Offspring partners (male)	181	37 (20%)	28 (16%)
TOTAL	12898	6482 (50%)	5443 (42%)

¹valid email address, marked as contactable for questionnaires² Proportions of those invited (i.e. eligible)**Table 2. Summary of key characteristics for those who responded; n (%) for categorical variables or mean (sd) for continuous variables.**

	Mothers	Fathers/partners	Offspring	Offspring partners
Age (years)	58.1 (4.43)	61.1 (5.2)	27.8 (0.61)	29.8 (4.18)
Latest BMI ¹	26.3 (5.07)	27.3 (3.97)	24.7 (5.24)	26.9 (4.99)
Latest Systolic BP ¹	119.4 (14.1)	132.7 (13.36)	115.2 (10.92)	114.8 (12.53)
Latest Diastolic BP ¹	70.5 (9.35)	77.2 (8.86)	66.8 (7.8)	65.7 (10.66)
Education level ² ≥A level	1364 (54.1%)	693 (70.1%)	1662 (78.6%)	25 (59.5%)
Ethnicity ³ White	2477 (98.4%)	978 (98.9%)	2341 (96.6%)	Not available

¹Data taken from the most recent clinic that individual attended where available²Data taken from pregnancy questionnaires for G0 and from most recent questionnaire for G1 where available³Data taken from pregnancy questionnaires for all**Table 3. Participant response to whether they have had COVID-19.**

	G0 - parents	G1 - offspring (+partners)	Total
Yes, positive test	12 (0.3%)	24 (0.9%)	36 (0.6%)
Yes, doctor suspected, no test	35 (1%)	56 (2%)	91 (1.4%)
Yes, own suspicions	422 (11.5%)	416 (14.9%)	838 (13%)
No	3202 (87.2%)	2304 (82.3%)	5506 (85.1%)

$$+ (0.31 \times \text{new persistent cough}) + (0.49 \times \text{severe fatigue}) \\ + (0.39 \times \text{decreased appetite}).$$

Predicted COVID-19 cases were obtained by applying an $\exp(x)/[1+(\exp(x))]$ transformation and coding values >0.5 as cases. We applied this algorithm to the symptom data collected in questionnaire 2 which asked about symptoms experienced 'since the middle of April (Easter Monday, 13th April)'.

Depending on when a participant responded this will have covered the last 6 to 10 weeks. In questionnaire 1 the proportion of predicted cases peaked in March with 4.19% of respondents predicted to be cases. All other months ranged between 2.10% - 2.38%. For this reporting period we predict that 3.1% of participants were possible cases (1.8% of female G0s, 3.2% of male G0s and 4.2% of G1 (3.8% of male G1 YPs and 4.3% of female G1 YPs). Our figures are still lower than the 5.36%

Table 4. Participant response to whether they have had COVID-19 in the first and second questionnaires (total n=5409).

Q2 response	Yes, positive test	Yes, doctor suspected, no test	Yes, own suspicions	No
Q1 response				
Yes, positive test	5	0	0	1
Yes, doctor suspected, no test	7	41	9	5
Yes, own suspicions	7	15	466	180
No	11	13	223	4426

of responders to the app¹³ who were reported as likely being infected by the virus.

Whilst we have presented these results as a mark of the type of analysis one can undertake using these data, we note that these predictions are subject to important assumptions, which we discussed in more detail in our previous data note⁶. In summary: 1) the intercept term in the model, representing the *base-line risk of having COVID-19* is assumed to be the same in this population as in the Menni study population; 2) the slight difference in the wording of symptoms in our study are assumed to capture the same information as those in the Menni study and 3) the fixed effects in the model, representing the *association of these symptoms with COVID-19* is assumed to be the same here as in the Menni study population.

Of the 965 participants who reported definite or suspected COVID, only 8 stated that they had been admitted to hospital (2 female G0s, 2 male G0s and 4 G1s). However, it should be noted that four of these reported no overnight stay (2 G0s and 2 G1s). One participant reported admission to an intensive care unit and one other to a high dependency unit.

In order to assess potential reasons for non-completion of the second COVID questionnaire, which could bias comparisons between questionnaire waves, we explored whether any sociodemographic factors were associated with returning this questionnaire if the participant had returned the first COVID questionnaire (Figure 2). Completing the second questionnaire was strongly associated with age/generation such that older/G0 participants were more likely to complete both questionnaires compared to younger/G1 participants. After adjusting for generation (G0 vs G1), response to the second COVID questionnaire was socially structured, such that those participants with higher education qualifications (a proxy for Socio-economic position) were much more likely to complete the second questionnaire having completed the first. Greater financial worry at the time of the first COVID questionnaire was associated with an increased drop-out at the second time point. Finally, physical and mental health – including having COVID-19 – were not strongly associated with continued participation, although a weak effect of greater anxiety was associated with a decreased odds of continuing participation.

Strengths and limitations of the data

This data collection has a number of strengths. Firstly, the timelines within which the collection occurred, allow comparisons

between the stringent mitigation measures early on in the pandemic and later easing of the lockdown measures. Secondly, the availability of repeat data obtained over time throughout the pandemic along with pre-pandemic baseline measures allows assessment of longitudinal change in health or wellbeing. For example, we have already been able to demonstrate the short-term impact the pandemic has had on mental health¹⁶. Thirdly, the alignment of measures with other UK studies provides potential for cross-cohort comparisons. This was achieved through the set of core questions developed by the Wellcome coordinated group¹⁷ and has already facilitated a co-ordinated analysis of mental health measures in ALSPAC and Generation Scotland¹⁶. We are planning further COVID-19 data collection towards the end of 2020 which will facilitate the examination of longer time impacts as these become clearer, particularly on the economy. Finally, we achieved an excellent response rate despite the lack of incentive and calling on our participants to take part in data collection for the second time in as many months. As we flagged for questionnaire 1, it should be noted that our online only strategy will likely have affected response rates from our G0 mothers who historically have tended to use paper questionnaires more than other sub-groups when completing questionnaires and for whom we are least likely to hold a current email address. However, the pandemic has led to a number of participants reaching out and getting in touch to provide these details, and indeed to re-engage with the study having dropped out previously. In addition, members of the study team have been contacting participants to ensure we have up to date email addresses, which goes partway to explaining the additional 1039 participants who completed this questionnaire but not the first.

A key limitation of this data collection is that in some cases, the data recorded is potentially identifiable. As with questionnaire 1 we have gone through each individual variable and made decisions as to whether we need to combine categories. This has only been carried out where we believe the data provides a high risk of potential disclosure (as detailed in the supplementary documentation file). Another limitation is that the response rate was non-random with regard to sex and socio-economic status; this could potentially introduce bias to analyses. Work is ongoing in the study to measure the potential selection bias that has been introduced in this and the first COVID-19 questionnaire and will be published in due course. We acknowledge there is a risk for people with severe COVID-19 to be under-represented in the study if they were too unwell to respond to questionnaires and we will be investigating this further using

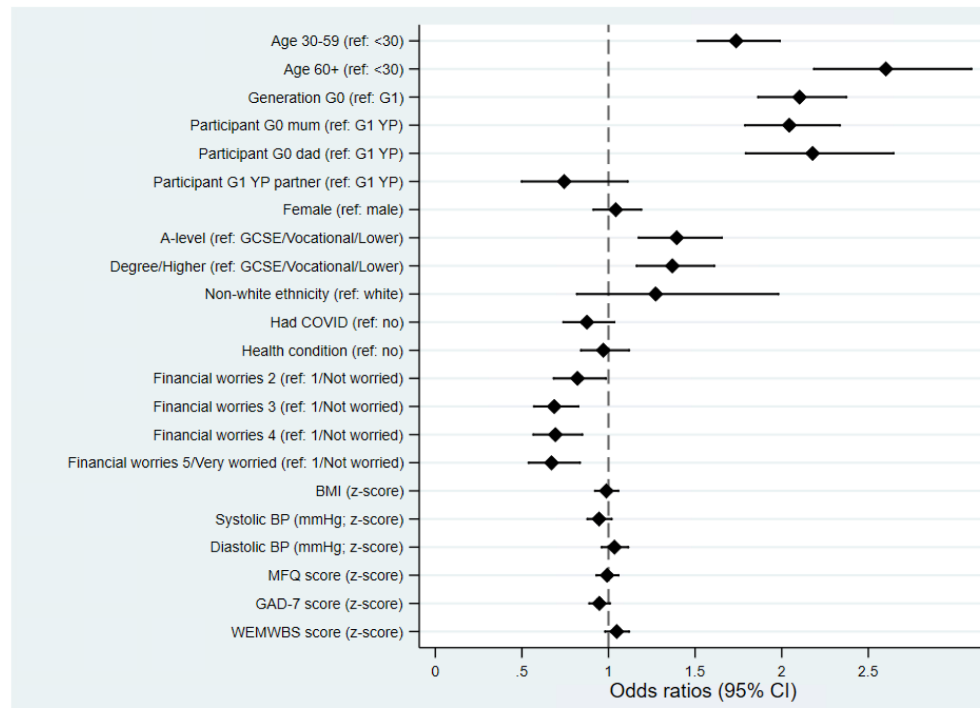


Figure 2. Forest plot describing the factors predicting completing the second COVID questionnaire, if the first was also completed. All results are odds ratios from logistic regression models with 'completing questionnaire 2' as the outcome. Other than 'age', 'generation' and 'participant' (which are univariable models), all models are adjusted for 'generation' (G0 vs G1). Results to the right of the dashed line indicate an increased odds of completing questionnaire 2 relative to the reference category, while results to the left indicate a decreased odds.

linkage to health records. Finally, we acknowledge that this observational dataset does not provide precise infection status. In particular, we note that: 1) asking individuals to report whether a doctor has suspected or whether they themselves suspected that they have been infected is insufficient to identify them as cases and 2) the use of the algorithm to predict cases is subject to a number of assumptions that we have discussed in the results section and elsewhere⁶. The predicted case status also contains measurement error. We will address this by providing more accurate measures of COVID-19 status in the future using a combination of serological testing and data linkage.

In summary, data obtained in the second ALSPAC COVID questionnaire aimed to capture changes in many aspects of people's lives as the pandemic persists and mitigation strategies continue to change. These data are available for researchers as described below.

Consent

Completion of the questionnaire was optional and choosing to complete the questionnaire is considered informed consent for the questionnaire.

Ethical approval for the study was obtained from the ALSPAC Ethics and Law Committee and the Local Research Ethics Committees. Informed consent for the use of data collected via questionnaires and clinics was obtained from participants following the recommendations of the ALSPAC Ethics and

Law Committee at the time. Study participants have the right to withdraw their consent for elements of the study or from the study entirely at any time. Full details of the ALSPAC consent procedures are available on the [study website](#)¹⁸.

Data availability

Underlying data

ALSPAC data access is through a system of managed open access. The steps below highlight how to apply for access to the data included in this data note and all other ALSPAC data:

1. Please read [the ALSPAC access policy](#)¹⁹ which describes the process of accessing the data and samples in detail, and outlines the costs associated with doing so.
2. You may also find it useful to browse our fully searchable [research proposals database](#)²⁰, which lists all research projects that have been approved since April 2011.
3. Please [submit your research proposal](#)²¹ for consideration by the ALSPAC Executive Committee. You will receive a response within 10 working days to advise you whether your proposal has been approved.

Please note that a standard COVID-19 dataset will be made available at no charge (see description below); however, costs for required paperwork and any bespoke datasets required additional variables will apply.

Extended data

Open Science Framework: ALSPAC COVID-19 First and Second Questionnaire. <https://doi.org/10.17605/OSF.IO/GU35Y>¹²

This project contains the following extended data

1. ALSPAC COVID Q2 FINAL.pdf (The final questionnaire REDCap PDF)
2. ALSPAC_COVID_varlist.pdf (List of variable names and labels)
3. ALSPAC COVID Q2 data dictionary.pdf (Associated data dictionary including frequencies of all variables that are available)

Data are available under the terms of the [Creative Commons Attribution 4.0 International license](#) (CC-BY 4.0).

COVID-19 Questionnaire 2 Data File

Data from the second ALSPAC COVID-19 questionnaire is available in two ways.

1. A freely available standard set of data containing *all* participants together with key sociodemographic variables (where available) is available on request (see data availability section). This dataset also includes data obtained from the first COVID questionnaire. Subject to the relevant paperwork being completed (costs may apply to cover administration) this dataset will be made freely available to any bona fide researcher requesting it. Variable names will follow the format *covid2_xxxx* where *xxxx* is a four-digit number. A full list of variables released is available here: <https://doi.org/10.17605/OSF.IO/GU35Y>¹². Frequencies of variable and details of any coding/editing decisions and derived variables are also available in the data dictionary: <https://doi.org/10.17605/OSF.IO/GU35Y>¹²
2. Formal release files have been created for G0 mothers, G0 fathers and G1 participants in the usual way and now form part of the ALSPAC resource (due to the small number of G1 partners contributing we will not be formally releasing this data, however, it may be available on request for specific G2 projects). These datasets (or sections therein) can be requested in the usual way. Variable names will replicate those in 1) above but as each variable in ALSPAC is uniquely defined we have added markers to denote the source of the variable. For example, in dataset 2, the age of the participant at completion (in years) is denoted by *covid2_9650*. In the mother's dataset this will be denoted by *covid2m_9650*, for fathers/partner this will be *covid2p_9650* and for the G1 generation it will be *covid2yp_9650*. Frequencies for all variables for each participant group are available in the data dictionary in the usual way²².

Table 5. Data from questions that will not be released until coded.

Question number	Question text
Section A	
3	Date first told had COVID-19
5	Date first admitted to hospital for treatment of COVID-19
7	Date discharged from hospital for treatment of COVID-19
Section B	
4	Other form of gambling
7	Date started self-isolating Other reason for self-isolating
Section C	
1	What other reason causing worry
6	Is there anything else you would like to tell us about how the pandemic has affected you?
Section D	
2	Other change in living arrangements
3	Postcode (this is being geocoded and will otherwise only be available following our split stage protocol)
Section E	
1	Other employment situation
3	Other keyworker sector
4	Other keyworker sector person participant lives with is in
11	Other help given to someone
12	Other help received from someone

Text data and other potentially disclosive information will not be released until they have been coded appropriately. [Table 5](#) describes the data that is withheld at the time of first release. Data will be incorporated back into both file sets as they become available.

Acknowledgements

We are extremely grateful to all the families who took part in this study, the midwives for their help in recruiting them, and the whole ALSPAC team, which includes interviewers, computer and laboratory technicians, clerical workers, research scientists, volunteers, managers, receptionists and nurses.

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Open Peer Review

Current Peer Review Status:  

Version 2

Reviewer Report 23 September 2020

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Denny Meyer 

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Competing Interests: No competing interests were disclosed.

Reviewer Expertise: mental health during COVID-19 statistical analysis

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Reviewer Report 23 September 2020

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Crispim Cerutti Junior 

Departamento de Medicina Social, Programa de Pós-Graduação em Doenças Infecciosas, Universidade Federal do Espírito Santo (Ufes), Vitória, Brazil

The paper by Northstone *et al.* presenting the results of the application of questionnaires in two moments during the follow-up of the Avon Longitudinal Study of Parents and Children (ALSPAC) has received my previous review, which resulted in some criticism and suggestions. The authors incorporated most of my propositions and generated a more descriptive version of their manuscript. However, they opted to keep their original keywords, and did not extend their analysis to other aspects that I highlighted, as lifestyle, employment, and finances. I suggest to

them also to avoid including brackets inside brackets, and initiating phrases by numbers.

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Infectious diseases and epidemiology.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Version 1

Reviewer Report 14 September 2020

<https://doi.org/10.21956/wellcomeopenres.17821.r40376>

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Crispim Cerutti Junior

Departamento de Medicina Social, Programa de Pós-Graduação em Doenças Infecciosas, Universidade Federal do Espírito Santo (Ufes), Vitória, Brazil

The paper by Northstone *et al.* presents the results of the application of questionnaires in two moments during the follow-up of the Avon Longitudinal Study of Parents and Children (ALSPAC). The purpose was to verify the status of the mental health, lifestyle, employment and finances during the COVID-19 pandemic. However, the results are focused mainly on the estimation of a COVID-19 episode and the rate of questionnaires response. Despite the cohort itself representing a significant contribution to the study of the health status of the population, the approach reported in this paper has several limitations. At first, the response rate was low (50%), raising the possibility of a selection bias. Second, the criteria to establish the presence of the infection were mostly imprecise. Clinical suspicion or self-assessment is not enough evidence of the disease process. In third place, the authors gathered data about a positive test and a clinical suspicion, which have a substantial difference in their strength for evidence. The fourth limitation was the decision to apply the kappa index to verify the agreement in the information about the disease between the first and the second questionnaire. It is inadequate, as it would be expected the occurrence of the infection precisely in the interval between the two data collections. In the fifth place, another imprecise information rests on the estimation of the diseases based on an uncertain algorithm taking specific symptoms into account. I suggest to restrict the approach to the disease itself to a simple description of the answers, concentrating the analysis on the other issues intended to consist objectives of the study, i.e., mental health, lifestyle, employment and finances.

Minor issue:

Keywords: the authors should be compliant with MeSH. The following keywords are not in MeSh:

ALSPAC, children of the '90s, birth cohort study, and online questionnaire.

Is the rationale for creating the dataset(s) clearly described?

Yes

Are the protocols appropriate and is the work technically sound?

Yes

Are sufficient details of methods and materials provided to allow replication by others?

Yes

Are the datasets clearly presented in a useable and accessible format?

Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Infectious diseases and epidemiology.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Author Response 15 Sep 2020

Kate Northstone, University of Bristol, Bristol, UK

Thank you for the constructive comments on our data note. As a result, we have improved the clarity of our message; namely, that our data is observational and we can not claim 'case' status as a result. You noted five limitations and one minor issue in your review and we provide our response as follows:

1. The response rate was low (50%), raising the possibility of a selection bias.

We completely agree with this comment and work is ongoing in this area measuring the bias which is to be published separately. We have made more of this in the discussion adding the following:

"Work is ongoing in the study to measure the potential selection bias that has been introduced in this and the first COVID-19 questionnaire and will be published in due course."

2. The criteria to establish the presence of the infection were mostly imprecise. Clinical suspicion or self-assessment is not enough evidence of the disease process.

Yes, we agree. The data note is providing a description of the responses we have received and as already noted we will be combining this data with linked health records and test results and to serology testing results in order to better establish 'cases'. We have emphasised this self-reported data as a limitation in the discussion – please see our response to point 5 where we provide our overall discussion changes.

3. Third place, the authors gathered data about a positive test and a clinical suspicion, which have a substantial difference in their strength for evidence.

This is a fair point and as above we have enhanced the discussion in line with our response to point 2. We also make clear in the abstract that this data is observational and that we will use the questionnaire data in combination with linkage and biological testing to attempt to identify cases.

4. The decision to apply the kappa index to verify the agreement in the information about the disease between the first and the second questionnaire. It is inadequate, as it would be expected the occurrence of the infection precisely in the interval between the two data collections.

We have removed the kappa statistic. The aim of that analysis to determine crossover between the two points to check that if an individual reported infection in questionnaire 1 they would also report it in questionnaire 2. We already acknowledge that infection may have occurred in the interim but concede that kappa is not the best measure, as agreement between the time points is a little deceiving.

5. Another imprecise information rests on the estimation of the diseases based on an uncertain algorithm taking specific symptoms into account. I suggest to restrict the approach to the disease itself to a simple description of the answers, concentrating the analysis on the other issues intended to consist objectives of the study, i.e., mental health, lifestyle, employment and finances.

We agree with the reviewer that the algorithm is imprecise and had acknowledged this in the results section and in our previous data note. We have further emphasised the limitations of this and the general observational nature of the data in the discussion as follows:

"...that this observational dataset does not provide precise infection status. In particular, we note that: 1) asking individuals to report whether a doctor has suspected or whether they themselves suspected that they have been infected is insufficient to identify them as cases and 2) the use of the algorithm to predict cases is subject to a number of assumptions that we have discussed in the results section and elsewhere ⁶"

Finally, we have removed reference to the algorithm derived cases from the abstract and focussed only on the self-reported data here.

Minor issue: Keywords: the authors should be compliant with MeSH. The following keywords are not in MeSh: ALSPAC, children of the '90s, birth cohort study, and online questionnaire.

It is study policy to include 'ALSPAC' as a keyword and we have therefore kept this. We are happy to remove the other keywords as suggested and can replace with "Questionnaires",

Competing Interests: No competing interests were disclosed.

Reviewer Report 10 September 2020

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Denny Meyer 

Centre for Mental Health, Faculty of Health, Arts and Design, Swinburne University of Technology, Melbourne, Vic, Australia

Using a large sample of participants from the Avon Longitudinal Study of Parents and Children this study reports the results of two questionnaires checking on COVID-19 symptoms and diagnoses. Interesting aspects of the study are a test of agreement for participants who completed both questionnaires and a comprehensive analysis of the factors associated with a lack of response for the second questionnaire. The algorithm used to estimate COVID-19 prevalence based on symptoms was clearly reported and the associated assumptions were clearly stated. The data provided and the detailed reporting of the methods used will allow replication by others. The authors are congratulated on their excellent response rate as well as an excellent report of the study methods and results.

Is the rationale for creating the dataset(s) clearly described?

Yes

Are the protocols appropriate and is the work technically sound?

Yes

Are sufficient details of methods and materials provided to allow replication by others?

Yes

Are the datasets clearly presented in a useable and accessible format?

Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: mental health during COVID-19 statistical analysis

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Author Response 15 Sep 2020

Kate Northstone, University of Bristol, Bristol, UK

Thank you for your positive review of our data note and for doing it so quickly!

Competing Interests: No competing interests were disclosed.
